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ORIGINAL ARTICLE

Retrospective Evaluation of Emergency Physician Judgment and Risk Scoring in Syncope Discharge Decisions

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Abstract

Background: The aim of this study was to compare emergency physician discharge decisions for syncope patients in the emergency department (ED) with two established risk stratification tools: the Osservatorio Epidemiologico sulla Sincope nel Lazio (OESIL) score and the San Francisco Syncope Rule (SFSR).

Methods: We retrospectively reviewed medical records of adult patients presenting to a university hospital ED with syncope from 2013 to 2017. High-risk classification was defined as an OESIL score ≥2 or at least one positive SFSR criterion. Physician decisions were categorized as high-risk if the patient was hospitalized. Patients were classified as having reflex, cardiac, or orthostatic hypotension syncope. The discharge decisions made by physicians were compared with OESIL and SFSR scores. Sensitivity, specificity, and predictive values for 1-year mortality were calculated.

Results: Among 457 patients included (median age 36, 95% reflex syncope), 411 (89.9%) were discharged from the ED. Based on risk scores, 114 (OESIL) and 139 (SFSR) patients were categorized as high risk. Concordance between physician decisions and risk scores was low (Kappa = 0.09 for OESIL, 0.12 for SFSR). The OESIL score demonstrated the highest sensitivity (77.8%) for predicting 1-year mortality, while the physician's decision showed the highest specificity (91%).

Conclusions: While physician decisions showed higher specificity, OESIL scores were more sensitive in identifying high-risk patients. In young, low-risk populations, reliance on clinical judgment may be reasonable, but a combined use of scoring tools and physician assessment could improve patient safety.

Keywords: Syncope, emergency medicine, risk scores.

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INTRODUCTION

Syncope is defined as a transient loss of consciousness due to temporary cerebral hypoperfusion, followed by spontaneous and complete recovery (1). According to the European Society of Cardiology (ESC), syncope is classified into three categories: reflex (neurally mediated), orthostatic hypotension, and cardiac syncope (2). Patients presenting with syncope account for approximately 1–6% of all emergency department (ED) visits (3). Hospital admission rates for patients complaining of syncope range from 12% to 83%, with the rate quite variable throughout the world (4). The etiology of syncope can be benign or life-threatening; therefore, recognizing patients with a life-threatening state is important (1, 5). Despite the availability of validated risk stratification tools, many clinicians rely primarily on their clinical judgment when making disposition decisions (4).

Whether based on clinical judgment or risk scoring, ED clinicians aim to admit high-risk patients and discharge those at low risk. In this context, using an objective and short risk stratification tool in the ED is important, but only a small number of prognostic scores have been developed for syncope. The Osservatorio Epidemiologico sulla Sincope nel Lazio (OESIL) risk score is mainly used for emergency patients in Europe (6, 7). Mortality increases significantly as this score increases. The OESIL score has proven useful in the short-term risk stratification of patients with syncope (4). The San Francisco Syncope Rule (SFSR) is used to identify patients who are at low risk for a 7-day serious outcome (8). Patients with one of the five risks are at high risk for a serious outcome (3).

Although these tools have shown varying degrees of sensitivity and specificity, their routine use in clinical practice remains limited. Previous studies have shown discrepancies between risk scores and physician decisions. The aim of this study is to determine whether physician decisions and two established risk scores can identify high-risk syncope patients, and to establish the level of agreement between them. This study aims to determine the level of agreement between physician decisions and two established risk scores and to evaluate how accurately these tools identify patients at high and low risk of 1-year mortality.

MATERIALS AND METHODS

Study Design and Population

This retrospective observational study was conducted at Gazi University Hospital, a tertiary care center with an annual ED census of approximately 55,000 patients. The study protocol received ethical approval from the Gazi University Local Ethics Committee on July 26, 2019 (Reference: 227/2019).

Patients aged ≥18 years were extracted from the institution's electronic health record (EHR) using the chief complaint of "syncope" (ICD-10 code R55 – syncope and collapse) between January 2013 and December 2017. Following a detailed file review, only those meeting the ESC criteria for syncope were included (9). Exclusion criteria were alternate causes of transient loss of consciousness, including seizure, stroke, hypoglycemia, post-traumatic amnesia, and psychiatric diagnoses.

Data Collection

Demographic characteristics (age, gender), clinical history, prodromal symptoms (e.g., blurred vision, sweating, nausea, exercise, micturition, defecation, and chest pain), presenting symptoms, vital signs, physical examination findings, ECG results, imaging studies, final diagnosis, and disposition decisions were extracted from electronic and paper-based medical records. ECGs were interpreted by senior emergency medicine residents and attending physicians for the presence of a non-sinus rhythm, sinus bradycardia (less than 40 beats per minute), bundle branch block, acute or chronic ischemia, a sinus pause of more than three seconds, a prolonged QT interval of more than 450 milliseconds, atrioventricular heart block, and a pacemaker or implantable cardioverter defibrillator.

For each patient, OESIL and SFSR scores were retrospectively calculated. The OESIL score assigns one point each for: age >65 years, abnormal ECG, history of cardiovascular disease, and absence of prodromal symptoms. A score ≥2 indicates high risk. The SFSR considers the presence of five factors: history of congestive heart failure, abnormal ECG, hematocrit <30%, shortness of breath, and systolic blood pressure <90 mmHg. The presence of any one criterion classifies a patient as high risk.

The primary outcome was all-cause mortality within one year. Due to the retrospective nature of the study and limitations in follow-up, other serious outcomes (e.g., arrhythmia, myocardial infarction, readmission) could not be systematically assessed. Mortality data were obtained from the National Death Notification System.

Physician decision was defined as "high risk" if the patient was admitted and "low risk" if discharged. This classification did not account for intermediate decisions such as observation or specialty consultations.

Statistical Analysis

Statistical analyses were performed using the IBM SPSS (Statistical Package for Social Sciences) statistical software version 20.0 (IBM Corporation, Armonk, NY, USA). Normally distributed continuous variables were described as mean and standard deviation (SD). Non-normally distributed continuous variables were described as median and interquartile range (IQR). Categorical variables were described as frequencies and percentages. Differences in categorical variables were evaluated by the $\chi 2$ test. Differences in continuous variables were evaluated by Student's t test or Mann-Whitney U test. Sensitivity, specificity, positive and negative predictive values, and likelihood ratios were calculated for each risk assessment strategy. The agreement between risk scores and physician decisions was evaluated using Cohen's Kappa coefficient. A p-value <0.05 was considered statistically significant.

RESULTS

Between January 2013 and December 2017, a total of 268,061 patients were evaluated in the ED of our tertiary care university hospital. Among them, 1,873 were initially coded with syncope (ICD-10 code R55). After a detailed chart review, 487 patients met the diagnostic criteria for true syncope based on ESC guidelines. Thirty of these were excluded after ED evaluation due to alternative diagnoses (e.g., seizure [n=6], cranial hemorrhage [n=5], stroke [n=8], cranial mass [n=3], others [n=8]). Ultimately, 457 patients were included in the final analysis (Figure 1).

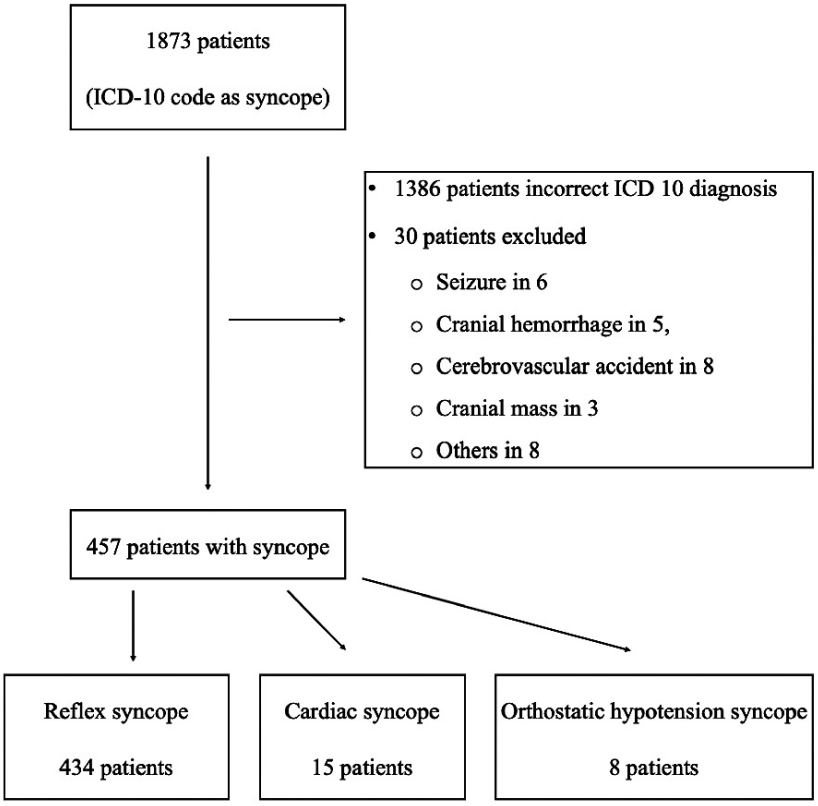

Figure 1: Flow chart of patients presenting to the emergency department with syncope

Table 1. Characteristics of Patients Presenting to the Emergency Department with Syncope

	All patients (n = 457)	Cardiac syncope (n = 15)	Orthostatic Hypotension syncope (n = 8)	Reflex syncope (n = 434)
Age, median (IQR)	36 (24–55)	64 (38–74)	50 (36–76)	35 (24–54)
Gender, n (%) Female	234 (51)	7 (47)	3 (37)	224 (52)
Prodromal symptoms, n(%)				
Lightheadedness	126 (28)	4 (27)	2 (25)	120 (28)
Blurred vision	109 (24)	5 (33)	3 (37)	101 (23)
Sweating	40 (9)	3 (20)	1 (13)	36 (8)
Nausea	28 (6)	2 (13)	0 (0)	26 (6)
Angina	23 (5)	1 (7)	0 (0)	22 (5)
Triggers, n (%)				
Micturition	8 (2)	0 (0)	0 (0)	8 (2)
Defecation	6 (1)	0 (0)	0 (0)	6 (1)
Exertion	6 (1)	0 (0)	0 (0)	6 (1)
Past medical history, n (%)				
Hypertension	73 (16)	5 (33)	2 (25)	66 (15)
Diabetes Mellitus	32 (7)	4 (27)	1 (13)	27 (6)
Coronary artery disease	22 (5)	6 (40)	0 (0)	19 (4)
Pacemaker/ICD	4 (1)	4 (27)	0 (0)	0 (0)
Cerebrovascular accident	4 (1)	0 (0)	0 (0)	4 (0.9)
Sick sinus syndrome	2 (0.4)	1 (7)	0 (0)	0 (0)
Mortality within 1-year period, n (%)	17	9	5	3

n: number; IQR: interquartile ranges; ICD: implantable cardioverter defibrillator

Of the 457 patients, 434 (95%) were diagnosed with reflex syncope, 15 (3.3%) with cardiac syncope, and 8 (1.8%) with orthostatic hypotension syncope. The median age was 36 years (IQR 24–55), and 234 (51.2%) were female. A majority (387 patients; 84.7%) were younger than 65 years. The most frequently reported prodromal symptoms were lightheadedness (27.6%), blurred vision (23.9%), sweating (8.8%), nausea (6.1%), and chest pain (5%). Reported triggers included micturition (1.8%), defecation (1.3%), and exertion (1.3%).

In terms of comorbidities, 73 (16%) had hypertension, 32 (7%) had diabetes mellitus, 25 (5.4%) had coronary artery

disease, 4 (0.9%) had stroke, and 4 (0.9%) had pacemakers/ICDs. ECGs were normal with sinus rhythm in 357 (77%) patients. The most common abnormal finding was sinus tachycardia in 42 patients (9.2%). Other findings included non-specific T wave changes (31; 6.4%), AV block (3; 0.6%), right bundle branch block (RBBB) (7; 1.4%), left bundle branch block (LBBB) (4; 0.8%), Brugada pattern (2; 0.4%), and pacemaker/ICD rhythm (2, 0.4%).

Cranial CT imaging was performed in 161 patients (35%), with normal results in 154 (33.7%). Consultations were requested in 52 patients (11.4%), most commonly from cardiology (n=34), neurology (n=7), and internal medicine (n=3).

Among the 457 patients, 411 (89.9%) were discharged from the ED. Within one year of follow-up, 17 deaths were identified. One patient died during ED evaluation with the diagnosis of non-ST Elevation myocardial infarction and pneumosepsis. Seven of the patients who died had been admitted to the hospital.

According to OESIL scoring, 114 patients (25%) were categorized as high risk. Of these, only 9 (7.9%) were admitted, while 105 were discharged. Among the high-risk OESIL group, 16 patients (14%) died within one year. Statistical analysis showed a significant discordance between physician decisions and OESIL classification (χ^2, p = 0.019), with low concordance (Cohen's Kappa = 0.09) (Table 2).

Based on SFSR, 139 patients (30.4%) were high risk; 12 (8.6%) of these were admitted, while 127 were discharged. Fourteen (10.1%) high-risk patients per SFSR died within one year. Again, there was a significant mismatch between physician judgment and SFSR classification (χ^2, p = 0.001), with low agreement (Cohen's Kappa = 0.12) (Table 2).

Sensitivity and specificity for identifying 1-year mortality varied by method. OESIL had the highest sensitivity (77.8%) and the highest positive likelihood ratio (3.81), while physician judgment had the highest specificity (91%) but the lowest sensitivity (22.2%). These findings are summarized in Table 3.

Table 2. Comparison of the Physician's Decision and OESIL Risk Score or SFSR Rating in the Context of high-risk Syncope Patients

High Risk	OESIL Risk Score			SFSR rating		
Physician's decision	Absent n (%*)	Present n (%*)		Absent n (%*)	Present n (%*)	
Absent	315 (91.8)	96 (84.2)	p= 0.019 K=0.09	296 (93.1)	115 (82.7)	p=0.001 K= 0.12
Present	28 (8.2)	18 (15.8)		22 (6.9)	24 (17.3)	
Total	343 (100)	114 (100)		318 (100)	139 (100)	

chi-square, *column percent OESIL: The Osservatorio Epidemiologico sulla Sincope nel Lazio; SFSR: The San Francisco Syncope Rule

Table 3. The Physician's Decision, Risk Stratification Tools, and their Sensitivity and Specificity in Predicting one-year Mortality

	Sensitivity	Specificity	Positive predictive value	Negative predictive value	Positive LR	Negative LR
SFSR rating	66.7	72.7	0.17	0.96	2.44	0.46
OESIL risk score	77.8	79.6	0.25	0.98	3.81	0.28
Physician's decision	22.2	91	0.17	0.93	2.47	0.85

LR: Likelihood ratio; OESIL: The Osservatorio Epidemiologico sulla Sincope nel Lazio; SFSR: The San Francisco Syncope Rule

DISCUSSION

This study evaluated the concordance between emergency physicians' discharge decisions and two established risk classification tools, OESIL and SFSR, in a predominantly young and low-risk population presenting with syncope. While similar comparisons have been made previously, our findings highlight the challenges and limitations of risk stratification in real-world ED settings, especially when reflex syncope dominates the patient profile.

Syncope can affect patients of all ages, and some hospitals have syncope units with standardized admission and discharge protocols. However, most medical centers discharge or hospitalise syncope patients according to the physicians' experience (4, 10). Our results confirmed that the OESIL score had the highest sensitivity (77.8%) for predicting 1-year mortality. Physician judgment demonstrated the highest specificity (91%) but low sensitivity (22.2%), suggesting that while clinicians are effective in identifying low-risk patients for discharge, some high-risk individuals may be missed.

According to the classification of syncope, the most common syncope type is the reflex syncope, which is mostly seen in young patients (11). The second most common type is cardiac syncope, which is a common complaint in older adults (12). Reflex syncope usually occurs with a typical prodrome and precipitating factors (13). It is usually triggered by prolonged standing, pain, or emotional events such as the sight of blood, or following injury or stress. This type of syncope is usually described in young patients who show triggers, who have a normal examination and ECG, and who have no family history of sudden death (14). In other words, a characteristic medical history is sufficient for the diagnosis of reflex syncope in the absence of any suspected or certain heart disease (4). The ESC guideline also emphasizes that the clinical history is the first and most important step for evaluation of this type of patient with syncope (14). Reflex syncope was also the most common type of syncope in our study, and it mostly presented with prodromal symptoms, such as lightheadedness, blurred vision, sweating, and nausea. Of our patients, 93% were discharged according to the physician's decision after the first evaluation in the ED.

Patients with cardiac syncope can be identified by medical history, clinical examination, and ECG (15). The mortality rate is high among patients with cardiogenic syncope, and it is estimated to be the cause of up to 40% of syncopal events in patients aged ≥ 65 (6, 13). In our study, the second most common syncope type was cardiac syncope, and one patient died in the ED. Nine of the patients with cardiac syncope died within one year.

In EDs with a high patient density or in which systematic approach algorithms cannot be established, the decision for hospitalization or discharge is usually made by the physicians based on their own experiences. This may result in unnecessary admissions of low-risk patients and inappropriate discharge of high-risk patients. Patients inappropriately discharged from the ED may have adverse events or even die from issues that could have been remedied by interventions available at the hospital (16). Finding the underlying cause of syncope in the ED is often difficult. This can result in unnecessary hospitalization, but preventing inappropriate hospitalization requires the ability to identify high-risk patients with syncope who need follow-up and treatment. Various scoring systems have been developed for this purpose, including the OESIL risk score or SFRS rating that we used in this study.

Quinn et al. showed that the SFSR has a sensitivity of 96% and specificity of 62% for short-term serious outcomes (17). A systematic review by Snead concluded that the SFSR sensitivity was 87% and its specificity was 52% for short-term serious outcomes (3). Dippaola et al. reported a sensitivity of 88% and specificity of 59% for the OESIL risk score (7). Another systematic review by Serrano et al. reported a sensitivity for the OESIL risk score of 95% and specificity of 31% (18). In our study, sensitivity and specifity of SFSR rating were 66.7% and 72.7%, respectively, while sensitivity and specifity of OESIL risk score 77.8% and 79.6%, respectively. In addition, the agreement between risk scores and physician decisions was poor, with Cohen's Kappa values of 0.09 (OESIL) and 0.12 (SFSR). This discrepancy may be attributed to several factors: first, the heavy predominance of reflex syncope in our cohort; second, the potential underperformance of existing risk scores in young populations; and third, the absence of detailed clinical context in the retrospective dataset.

The study has several limitations. First, this was a single-center, retrospective study with a small number of adverse outcomes. Second, reliance on ICD-10 coding at triage introduced misclassification bias, as over 75% of initially coded syncope patients were excluded after chart review. Thirdly, the majority of our patients were young and had reflex syncope. The small number of patients in the other groups also made comparisons with the literature difficult. Finally, as an outcome, we only evaluated hospitalization and mortality, which limited the generalizability of the study.

Despite these limitations, our findings suggest that reflex syncope remains the most common presentation in young ED patients and that current risk scores may have limited discriminatory power in such populations. Integrating risk scores with clinician expertise may offer a balanced approach to discharge decisions, especially when validated in prospective settings with broader outcome tracking.

REFERENCES

1. Badila E, Negrea C, Ripa A, Weiss E, Bartos D, Tirziu C. The Etiology of Syncope in an Emergency Hospital. Rom J Intern Med. 2016;54(3):173-8.
2. Puppala VK, Dickinson O, Benditt DG. Syncope: classification and risk stratification. J Cardiol. 2014;63(3):171-7.
3. Snead GR, Wilbur LG. Can the San Francisco Syncope Rule predict short-term serious outcomes in patients presenting with syncope? Ann Emerg Med. 2013;62(3):267-8.
4. Dipaola F, Costantino G, Solbiati M, Barbic F, Capitanio C, Tobaldini E, et al. Syncope risk stratification in the ED. Auton Neurosci. 2014;184:17-23.
5. Awan A, Iftikhar H, Tiruneh F, Soherwardi S, Larbi D. Etiology and Age Distribution of Syncope in a Predominantly African-American Population. Cureus. 2017;9(6):e1354.
6. Sun BC, Costantino G, Barbic F, Bossi I, Casazza G, Dipaola F, et al. Priorities for emergency department syncope research. Ann Emerg Med. 2014;64(6):649-55 e2.
7. Dipaola F, Costantino G, Perego F, Borella M, Galli A, Cantoni G, et al. San Francisco Syncope Rule, Osservatorio Epidemiologico sulla Sincope nel Lazio risk score, and clinical judgment in the assessment of short-term outcome of syncope. Am J Emerg Med. 2010;28(4):432-9.
8. Birnbaum A, Esses D, Bijur P, Wollowitz A, Gallagher EJ. Failure to validate the San Francisco Syncope Rule in an independent emergency department population. Ann Emerg Med. 2008;52(2):151-9.
9. Brignole M, Moya A, de Lange FJ, Deharo JC, Elliott PM, Fanciulli A, et al. 2018 ESC Guidelines for the diagnosis and management of syncope. Eur Heart J. 2018;39(21):1883-948.
10. Numeroso F, Mossini G, Spaggiari E, Cervellin G. Syncope in the emergency department of a large northern Italian hospital: incidence, efficacy of a short-stay observation ward and validation of the OESIL risk score. Emerg Med J. 2010;27(9):653-8.
11. Longo S, Legramante JM, Rizza S, Federici M. Vasovagal syncope: An overview of pathophysiological mechanisms. Eur. J. Intern. Med. 2023;112:6-14.
12. Gauer RL. Evaluation of syncope. Am Fam Physician. 2011;84(6):640-50.
13. Ali NJ, Grossman SA. Geriatric Syncope and Cardiovascular Risk in the Emergency Department. J Emerg Med. 2017;52(4):438-48 e3.
14. Sutton R. Reflex syncope: Diagnosis and treatment. J Arrhythm. 2017;33(6):545-52.
15. Albassam OT, Redelmeier RJ, Shadowitz S, Husain AM, Simel D, Etchells EE. Did This Patient Have Cardiac Syncope?: The Rational Clinical Examination Systematic Review. JAMA. 2019;321(24):2448-57.
16. Costantino G, Falavigna G, Solbiati M, Casagranda I, Sun BC, Grossman SA, et al. Neural networks as a tool to predict syncope risk in the Emergency Department. Europace. 2017;19(11):1891-5.
17. Quinn JV, Stiell IG, McDermott DA, Sellers KL, Kohn MA, Wells GA. Derivation of the San Francisco Syncope Rule to predict patients with short-term serious outcomes. Ann Emerg Med. 2004;43(2):224-32.
18. Serrano LA, Hess EP, Bellolio MF, Murad MH, Montori VM, Erwin PJ, et al. Accuracy and quality of clinical decision rules for syncope in the emergency department: a systematic review and meta-analysis. Ann Emerg Med. 2010;56(4):362-73 e1.

Abbreviations List

CT: Computed tomography, ECG: Electrocardiography, ED: Emergency department, EHR: Electronic health record, ESC: European Society of Cardiology, IQR: interquartile range, LBBB: left bundle branch block, OESIL: Osservatorio Epidemiologico sulla Sincope nel Lazio, RBBB: right bundle branch block, SFSR: San Francisco Syncope Rule.

Ethics Approval and Consent to Participate

The Ethics Committee of the Gazi University approved the study on July 26, 2019 (Reference: 227/2019). As our study was retrospective and organised using information from patient records in the hospital's electronic medical record, patient consent was not obtained.

Consent for Publication

Not applicable.

Availability of Data and Materials

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Competing Interests

The authors declare no competing interests.

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Author Contributions

All authors contributed to the study conception, methodology and design. Data collections were performed by KSK, AYÖ, ASY, GA. Formal analysis was performed by MA, İK. The first draft of the manuscript was written by AK, ŞGA, SCY. All authors read and approved the final manuscript.

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